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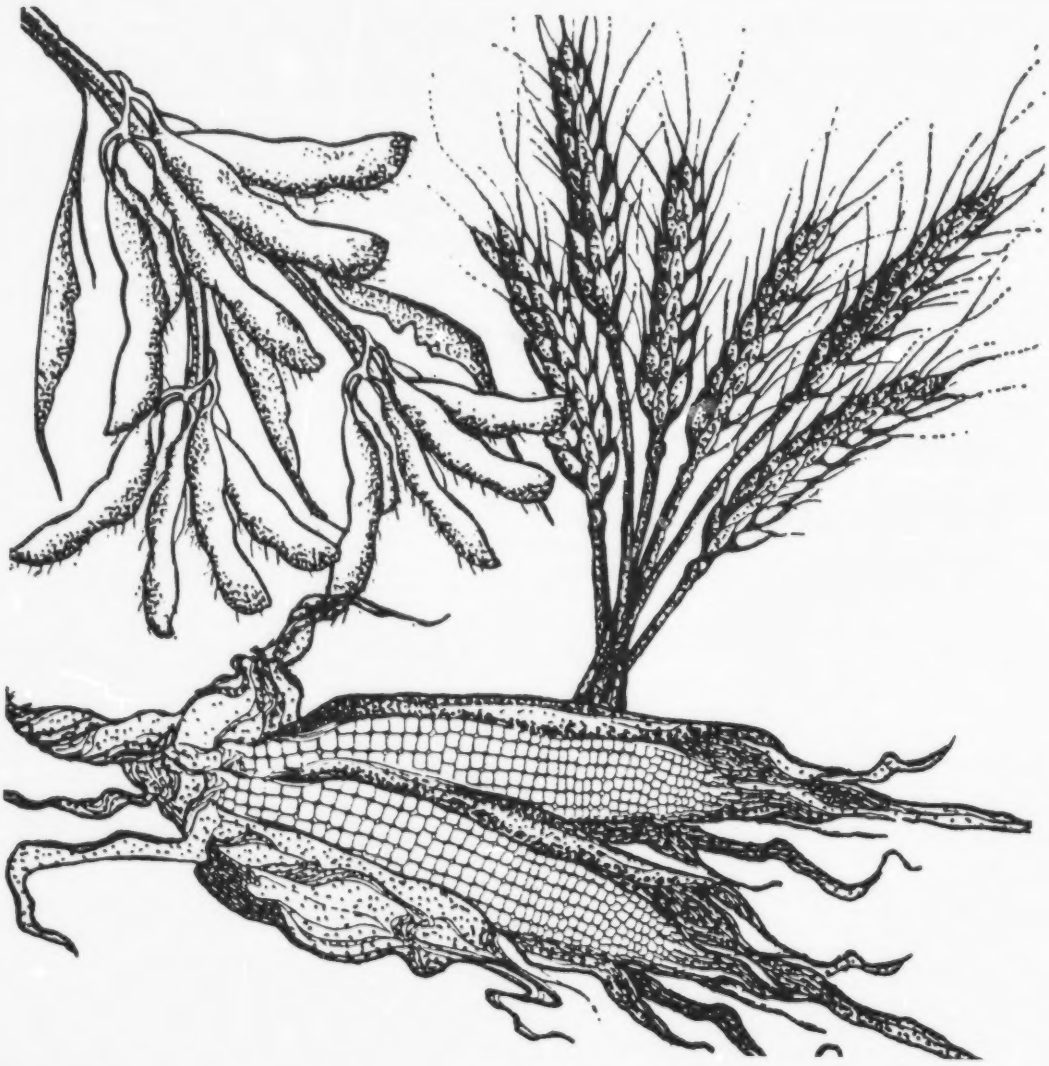
GRAIN AND FORAGE CROPS: ESTIMATED PRODUCTION COSTS ONTARIO, 1989



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

ECONOMICS INFORMATION

Report No. 89-05

GRAIN AND FORAGE CROPS

ESTIMATED PRODUCTION COSTS

ONTARIO, 1989

by

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch now use micro-computers in the preparation of cost data. Computer simulation now replaces the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models will accurately reflect the appropriate production technology for each commodity.

Information on inputs is obtained from a number of sources, including:

1. previous studies done by this Branch;
2. surveys of the farm supply trade;
3. technical input/output coefficients; and
4. the consensus of producers, researchers, extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture, modified and rewritten by the Economics and Policy Coordination Branch to accommodate Ontario agricultural conditions. The 1989 cost of production estimates presented in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are operator labour, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, and other overhead costs.

LABOUR HOURS AND COSTS

The required number of labour hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labour hours and costs vary with the yields used in the cost estimate.

The operator labour hours were valued at $8.00 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labour cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labour pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 7.7 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 13.0 percent, plus one for a total of 14.0 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were originally based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food, with subsequent updating based on price indices provided by Statistics Canada.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 26.0 cents/litre; diesel - 23.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost. Fuel costs are net of all 1989 Provincial and Federal rebates. The Federal Sales Tax rebate is scheduled to be reduced on January 1, 1990 for both gasoline and diesel. Also, the Federal Excise Tax rebate on gasoline is being eliminated effective January 1, 1990.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis, and obtained from report number 89-01 "A Survey of Custom Farmwork Rates Charged in Ontario, 1988.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farm land have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the average prime rate for 1988 of 10.8 percent discounted for the rate of inflation of 4.0 percent, which resulted in a 6.8 percent rate. It was assumed that land for all study crops would be purchased in the previous year prior to cropping.

No farm real estate taxes were charged to any study crop because of the 1989 Ontario Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 5.1 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances are made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labour and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1989 of 13.0 percent plus 1 percent for a rate of 14.0 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions. Costs for these were obtained from the respective Marketing Boards, Crop Insurance Commission and Ontario Grain Dealers Association.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated. For many crops the yield will vary considerably within the Province.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, the investment in machinery and land, and to other overhead costs. A different expected yield and/or price could considerably change the gross margin calculated.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs include all variable costs, as well as interest on the debt portion of tractor and machine investment, and other overhead costs.

Table 1.--Barley: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 0.9 hours/ha	5	2
Seed, 111 kg/ha	52	21
Fertilizer, N - 44 kg/ha; P_2O_5 - 44 kg/ha; K_2O - 44 kg/ha	77	31
Herbicide	5	2
Tractor and machine costs:		
Repairs and maintenance	40	16
Fuel	25	10
Crop insurance	12	5
Interest on operating capital	10	4
TOTAL VARIABLE COSTS	**226**	**91**
FIXED COSTS		
Operator labour, 3.46 hours/ha	27	11
Management allowance, 5% of gross income	17	7
Tractor and machine costs:		
Depreciation	52	21
Interest on investment	40	16
Insurance and storage	12	5
Interest on land, $1,557/ha @ 6.8% per annum	106	43
Other overhead	37	15
TOTAL FIXED COSTS	**291**	**118**
TOTAL ALL COSTS[a]	**517**	**209**
COST PER UNIT (Based on average yields of 3.18 tonnes/ha and 59 bushels/acre)[b]	**162.58/tonne**	**3.54/bu.**
GROSS MARGIN ANALYSIS (Based on average prices of $113.54/tonne and $2.47/bushel)[c]		
Gross income	361	146
Total variable costs	226	91
Gross margin	135	55
CASH ANALYSIS		
Gross income	361	146
Cash costs[d]	280	113
Returns over cash costs	81	33

[a] Storage costs not included, also costs and returns for straw handling not considered.
[b] Five-year average yields for 1984-88.
[c] Five-year average prices 1984-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $17/ha ($7/acre) plus other overhead costs.

Table 2.--Barley: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	33.36	13.50
Discing	1	.30	.12	15.52	6.28
Spreading fertilizer	1	.49	.20	12.95	5.24
Cultivating & harrowing	1	.25	.10	10.33	4.18
Hauling seed	1	.15	.06	4.42	1.79
Planting	1	.59	.24	23.50	9.51
Spraying herbicide	1	.30	.12	8.50	3.44
Combining	1	.74	.30	70.37	28.48
Hauling & unloading at storage	1	.74	.30	20.71	8.38

Table 3.--Grain Corn: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 1.24 hours/ha	7	3
Seed, 61,775 kernels/ha	67	27
Fertilizer, N - 156 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	104	42
Herbicide	54	22
Insecticide	29	12
Tractor and machine costs:		
Repairs and maintenance	42	17
Fuel	25	10
Custom drying charges	79	32
Custom storage, 1/2 crop for 5 months	25	10
Custom apply "N"	20	8
Crop insurance	12	5
Marketing fee	2	1
Interest on operating capital	32	13
TOTAL VARIABLE COSTS	**498**	**202**
FIXED COSTS		
Operator labour, 3.08 hours/ha	25	10
Management allowance, 5% of gross income	37	15
Tractor and machine costs:		
Depreciation	57	23
Interest on investment	42	17
Insurance and storage	12	5
Interest on land, $2,659/ha @ 6.8% per annum	180	73
Other overhead	37	15
TOTAL FIXED COSTS	**390**	**158**
TOTAL ALL COSTS	**888**	**360**
COST PER UNIT (Based on average yields of 6.28 tonnes/ha and 100 bushels/acre)[a]	**141.40/tonne**	**3.60/bu.**
GROSS MARGIN ANALYSIS (Based on average prices of $116.61/tonne and $2.96/bushel)[b]		
Gross income	732	296
Total variable costs	498	202
Gross margin	234	94
CASH ANALYSIS		
Gross income	732	296
Cash costs[c]	554	225
Returns over cash costs	178	71

[a] Five-year average yields for 1984-88.
[b] Five-year average price for 1984-88.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $19/ha ($8/acre) plus other overhead costs.

Table 4.--Grain Corn: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing, fall	1	.79	.32	33.36	13.50
Discing	1	.30	.12	15.52	6.28
Spray herbicide	1	.30	.12	8.50	3.44
Cultivate, harrow and pack	1	.32	.13	14.23	5.76
Hauling seed	1	.12	.05	3.71	1.50
Planting	1	.59	.24	30.94	12.52
Row cultivating	1	.32	.13	8.75	3.54
Custom apply "N"	1	--	--	20.63	8.35
Combining	1	.79	.32	75.07	30.38
Hauling to storage	1	.79	.32	21.32	8.63
Custom drying	1	--	--	78.33	31.70

-- Not applicable.

Table 5.--Oats: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 0.9 hours/ha	5	2
Seed, certified, 62 kg/ha	40	16
Fertilizer, N - 44 kg/ha; P_2O_5 - 44 kg/ha; K_2O - 44 kg/ha	77	31
Herbicide	5	2
Tractor and machine costs:		
Repairs and maintenance	40	16
Fuel	25	10
Crop insurance	12	5
Interest on operating capital	10	4
TOTAL VARIABLE COSTS	**214**	**86**
FIXED COSTS		
Operator labour, 3.46 hours/ha	27	11
Management allowance, 5% of gross income	15	6
Tractor and machine costs:		
Depreciation	52	21
Interest on investment	40	16
Insurance and storage	12	5
Interest on land, $1,557/ha @ 6.8% per annum	106	43
Other overhead	37	15
TOTAL FIXED COSTS	**289**	**117**
TOTAL ALL COSTS[a]	**503**	**203**
COST PER UNIT (Based on average yields of 2.25 tonnes/ha and 59 bushels/acre)[b]	**223.56/tonne**	**3.44/bu.**
GROSS MARGIN ANALYSIS (Based on average prices of $123.07/tonne and $1.90/bushel)[c]		
Gross income	277	112
Total variable costs	214	86
Gross margin	63	26
CASH ANALYSIS		
Gross income	277	112
Cash costs[d]	268	108
Returns over cash costs	9	4

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Five-year average yields for 1984-88.

[c] Five-year average prices 1984-88.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $17/ha ($7/acre) plus other overhead costs.

Table 6.--Oats: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	33.36	13.50
Discing	1	.30	.12	15.52	6.28
Spreading fertilizer	1	.49	.20	12.95	5.24
Cultivate and harrow	1	.25	.10	10.33	4.18
Hauling seed	1	.15	.06	4.42	1.79
Planting	1	.59	.24	23.50	9.51
Spraying herbicide	1	.30	.12	8.50	3.44
Combining	1	.74	.30	70.37	28.48
Hauling and unloading at storage	1	.74	.30	20.70	8.38

Table 7.--Soybeans: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 1.60 hours/ha	10	4
Seed, 91 kg/ha	59	24
Fertilizer, N - 15 kg/ha; P_2O_5 - 54 kg/ha; K_2O - 27 kg/ha	52	21
Herbicide	54	22
Tractor and machine costs:		
Repairs and maintenance	40	16
Fuel	23	9
Custom storage, 1/2 crop for 5 months	10	4
Crop insurance	12	5
Marketing fees	2	1
Interest on operating capital	17	7
TOTAL VARIABLE COSTS	**279**	**113**
FIXED COSTS		
Operator labour, 2.56 hours/ha	20	8
Management allowance, 5% of gross income	32	13
Tractor and machine costs:		
Depreciation	54	22
Interest on investment	42	17
Insurance and storage	12	5
Interest on land, $2,659/ha @ 6.8% per annum	180	73
Other overhead	37	15
TOTAL FIXED COSTS	**377**	**153**
TOTAL ALL COSTS	**656**	**266**
COST PER UNIT (Based on average yields of 2.42 tonnes/ha and 36 bushels/acre)[a]	**271.07/tonne**	**7.39/bu.**
GROSS MARGIN ANALYSIS (Based on average prices of $266.91/tonne and $7.26/bushel)[b]		
Gross income	646	261
Total variable costs	279	113
Gross margin	367	148
CASH ANALYSIS		
Gross income	646	261
Cash costs[c]	334	135
Returns over cash costs	312	126

[a] Five-year average yields for 1984-88.
[b] Five-year average price for 1984-88.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $18/ha ($7/acre) plus other overhead costs.

Table 8.--Soybeans: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing, fall	1	.72	.29	30.10	12.18
Discing	1	.30	.12	15.52	6.28
Incorporate spray	1	.32	.13	14.11	5.71
Hauling seed	1	.12	.05	3.58	1.45
Planting	1	.49	.20	25.77	10.43
Rotary hoeing	1	.27	.11	7.76	3.14
Row cultivating	1	.40	.16	10.25	4.15
Combining	1	.77	.31	72.75	29.44
Hauling to storage	1	.77	.31	20.41	8.26

Table 9.--White Beans: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 1.3 hours/ha	7	3
Seed, 49 kg/ha	57	23
Fertilizer, N - 28 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 32 kg/ha	64	26
Herbicide	86	35
Fungicide	10	4
Tractor and machine costs:		
Repairs and maintenance	47	19
Fuel	25	10
Custom haul	10	4
Crop insurance	44	18
Marketing fees	7	3
Interest on operating capital	25	10
TOTAL VARIABLE COSTS	**382**	**155**
FIXED COSTS		
Operator labour, 7.3 hours/ha	59	24
Management allowance, 5% of gross income	47	19
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	72	29
Insurance and storage	20	8
Interest on land, $2,659/ha @ 6.8% per annum	180	73
Other overhead	37	15
TOTAL FIXED COSTS	**509**	**206**
TOTAL ALL COSTS[a]	**891**	**361**
COST PER UNIT (Based on average yields of 1.54 tonnes/ha and 13.76 cwt/acre)[b]	**578.57/tonne**	**26.23/cwt.**
GROSS MARGIN ANALYSIS (Based on average prices of $601.41/tonne and $27.28/cwt)[c]		
Gross income	926	375
Total variable costs	382	155
Gross margin	544	220
CASH ANALYSIS		
Gross income	926	375
Cash costs[d]	450	183
Returns over cash costs	476	192

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Five-year average yields for 1984-88.

[c] Three-year average prices 1986-88.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $31/ha ($13/acre) plus other overhead costs.

Table 10.--White Beans: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	1.24	.50	42.80	17.32
Field cultivate	3	1.11	.45	33.93	13.73
Spray herbicide (preplant)	1	.49	.20	12.13	4.91
Incorporate spray	1	.37	.15	11.29	4.57
Haul seed and fertilizer	1	.22	.09	4.82	1.95
Planting	1	.74	.30	34.22	13.85
Pick stones	1	1.11	.45	17.45	7.06
Row cultivate	2	1.48	.60	31.51	12.75
Spray herbicide (preemerge)	1	.49	.20	11.19	4.53
Pull and windrow	1	.69	.28	61.35	24.83
Combining	1	.69	.28	65.70	26.59
Custom hauling to market	1	--	--	9.24	3.74

-- Not applicable.

Table 11.--Winter Wheat: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 0.15 hours/ha	1	x
Seed, 141 kg/ha	64	26
Fertilizer, N - 93 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	104	42
Herbicide	5	2
Tractor and machine costs:		
Repairs and maintenance	42	17
Fuel	25	10
Custom apply "N"	12	5
Crop insurance	12	5
Marketing board fee	5	2
Interest on operating capital	25	10
TOTAL VARIABLE COSTS	**295**	**119**
FIXED COSTS		
Operator labour, 4.32 hours/ha	35	14
Management allowance, 5% of gross income	27	11
Tractor and machine costs:		
Depreciation	57	23
Interest on investment	42	17
Insurance and storage	12	5
Interest on land, $2,659/ha @ 6.8% per annum	180	73
Other overhead	37	15
TOTAL FIXED COSTS	**390**	**158**
TOTAL ALL COSTS[a]	**685**	**277**
COST PER UNIT (Based on average yields of 3.83 tonnes/ha and 57 bushels/acre)[b]	**178.85/tonne**	**4.86/bu.**
GROSS MARGIN ANALYSIS (Based on average prices of $142.93/tonne and $3.89/bushel)[c]		
Gross income	547	222
Total variable costs	295	119
Gross margin	252	103
CASH ANALYSIS		
Gross income	547	222
Cash costs[d]	348	140
Returns over cash costs	199	82

x = less than 50 cents per acre.

a Storage costs not included, also costs and returns for straw handling not considered.

b Five-year average yields for 1984-88.

c Five-year average price for 1984-88.

d Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $16/ha ($6/acre) plus other overhead costs.

Table 12.--Winter Wheat: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	33.36	13.50
Discing	2	.59	.24	30.99	12.54
Spreading fertilizer	1	.25	.10	6.47	2.62
Cultivating, harrowing and packing	1	.30	.12	13.49	5.46
Hauling seed	1	.15	.06	4.42	1.79
Planting in fall	1	.62	.25	24.49	9.91
Applying "N" in spring (Custom)	1	--	--	12.35	5.00
Spraying herbicide	1	.30	.12	8.50	3.44
Combining	1	.74	.30	70.37	28.48
Hauling to elevator	1	.74	.30	20.93	8.47

-- Not applicable.

Table 13.--Kidney and Cranberry Beans: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 1.3 hours/ha	7	3
Seed, 85 kg/ha	126	51
Fertilizer, N - 58 kg/ha; P_2O_5 - 48 kg/ha; K_2O - 24 kg/ha	74	30
Herbicide	47	19
Tractor and machine costs:		
Repairs and maintenance	49	20
Fuel	25	10
Custom haul	12	5
Crop insurance	40	16
Interest on operating capital	27	11
TOTAL VARIABLE COSTS	**407**	**165**
FIXED COSTS		
Operator labour, 7.3 hours/ha	59	24
Management allowance, 5% of gross income	62	25
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	72	29
Insurance and storage	20	8
Interest on land, $2,659/ha @ 6.8% per annum	180	73
Other overhead	37	15
TOTAL FIXED COSTS	**524**	**212**
TOTAL ALL COSTS[a]	**931**	**377**
COST PER UNIT (Based on average yields of 1.72 tonnes/ha and 15.35 cwt/acre)	**541.28/tonne**	**24.56/cwt**
GROSS MARGIN ANALYSIS (Based on average prices of $727.52/tonne and $33.00/cwt)		
Gross income	1,251	507
Total variable costs	407	165
Gross margin	844	342
CASH ANALYSIS		
Gross income	1,251	507
Cash costs[b]	475	192
Returns over cash costs	776	315

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $31/ha ($12/acre) plus other overhead costs.

Note: Average yield of 15.35 cwt. is based on a 1987 survey. Estimated 1989 price is $33.00/cwt.

Table 14.--Kidney and Cranberry Beans: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	1.24	.50	42.80	17.32
Field cultivate	3	1.11	.45	33.93	13.73
Spray herbicide (preplant)	1	.49	.20	11.19	4.53
Incorporate spray	1	.37	.15	11.29	4.57
Haul seed and fertilizer	1	.22	.09	4.82	1.95
Planting	1	.74	.30	34.22	13.85
Pick stones	1	1.11	.45	17.45	7.06
Row cultivate	2	1.48	.60	31.51	12.75
Spray herbicide (preemerge)	1	.49	.20	11.19	4.53
Pull and windrow	1	.69	.28	61.35	24.83
Combining	1	.69	.28	65.70	26.59
Custom hauling to market	1	--	--	11.17	4.52

-- Not applicable.

Table 15.--Alfalfa Hay: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Establishment costs:		
Alfalfa seed, 11.1 kg/ha	85	34
Timothy seed, 2.5 kg/ha	7	3
Fertilizer; P_2O_5 - 33 kg/ha; K_2O - 100 kg/ha (applied)	62	25
Herbicide	23	9
Crop insurance	7	3
TOTAL ESTABLISHMENT COSTS	**184**	**74**
Annual cost (establishment costs spread over 3 years of production)	62	25
Hired labour, 6.05 hours/ha	37	15
Fertilizer, P_2O_5 - 37 kg/ha; K_2O - 111 kg/ha (fall applied)	64	26
Twine	25	10
Tractor and machine costs:		
Repairs and maintenance	30	12
Fuel	15	6
Crop insurance	17	7
Interest on operating capital	17	7
TOTAL VARIABLE COSTS	**267**	**108**
FIXED COSTS		
Operator labour, 5.27 hours/ha	42	17
Management allowance, 5% of gross income	35	14
Tractor and machine costs:		
Depreciation	109	44
Interest on investment	84	34
Insurance and storage	25	10
Interest on land, $2,204/ha @ 6.8% per annum	151	61
Other overhead	37	15
TOTAL FIXED COSTS	**483**	**195**
TOTAL ALL COSTS[a]	**750**	**303**
COST PER UNIT (Based on average yields of 9.0 tonnes/ha and 4.0 tons/acre)[b]	**83.33/tonne**	**75.75/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $76.95/tonne and $69.85/ton)[b]		
Gross income	693	279
Total variable costs	267	108
Gross margin	426	171
CASH ANALYSIS		
Gross income	693	279
Cash costs[c]	341	138
Returns over cash costs	352	141

[a] Storage costs not included.

[b] The yield and price used is above the Ontario five-year average to reflect the higher yield and greater crude protein obtained with Alfalfa Hay.

[c] Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $37/ha ($15/acre) plus other overhead costs.

Table 16.--Alfalfa Hay: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fertilizing	1	.20	.08	4.99	2.02
Cutting	2	1.64	.66	112.35	45.47
Raking	2	1.38	.56	49.30	19.95
Baling and loading (1st cut)[a]	1	2.32	.94	61.43	24.86
Baling and loading (2nd cut)[b]	1	1.72	.70	45.74	18.51
Hauling and unloading (1st cut)	1	2.30	.93	36.94	14.95
Hauling and unloading (2nd cut)	1	1.73	.70	27.58	11.16

[a] Yield 1st cut 5.2 tonnes/ha; 2.3 tons/acre.

[b] Yield 2nd cut 3.8 tonnes/ha; 1.7 tons/acre.

Table 17.-- Corn Silage: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 0.1 hours/ha	1	1
Seed, 66,717 kernels/ha	64	26
Fertilizer, N - 127 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	96	39
Herbicide	54	22
Insecticide	29	12
Tractor and machine costs:		
Repairs and maintenance	20	8
Fuel	15	6
Custom apply "N"	20	8
Custom harvesting and silo filling	133	54
Silo repair and maintenance	2	1
Interest on operating capital	30	12
TOTAL VARIABLE COSTS	**464**	**189**
FIXED COSTS		
Operator labour, 2.57 hours/ha	20	8
Management allowance, 5% of gross income	35	14
Tractor and machine costs:		
Depreciation	30	12
Interest on investment	20	8
Insurance and storage	7	3
Interest on land, $2,204/ha @ 6.8% per annum	151	61
Silo; interest, depreciation and insurance	75	30
Other overhead costs	37	15
TOTAL FIXED COSTS	**375**	**151**
TOTAL ALL COSTS	**839**	**340**
COST PER UNIT (Based on average yields of 29.6 tonnes/ha and 13.2 tons/acre)[a]	**28.34/tonne**	**25.76/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $23.37/tonne and $21.16/ton)[b]		
Gross income	692	279
Total variable costs	464	189
Gross margin	228	90
CASH ANALYSIS		
Gross income	692	279
Cash costs[c]	510	208
Returns over cash costs	182	71

[a] Yield is the five-year average for 1984-88.

[b] Silage price is the five-year average for 1984-88.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $9/ha ($4/acre) plus other overhead costs.

Table 18.--Corn Silage: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	33.36	13.50
Discing	1	.30	.12	15.52	6.28
Cultivating, harrowing and packing	1	.30	.12	13.49	5.46
Hauling seed	1	.15	.06	4.42	1.79
Planting	1	.59	.24	30.94	12.52
Row cultivating	1	.30	.12	8.08	3.27
Custom applying "N"	1	--	--	20.63	8.35
Custom harvesting and silo filling	1	--	--	132.30	53.54

-- Not applicable.

Appendix Table 1.--Average Farm Yields, Grain and Forage Crops, Ontario, 1983-1988, (Imperial Units).

Crop	1983	1984	1985	1986	1987	1988[a]	1984-88 5-Year Average
				- bushels per acre -			
Winter Wheat	50	57	67	54	52	55	57
Spring Wheat	36	43	51	41	42	39	43
Rye	34	37	40	35	37	29	36
Oats	46	60	67	61	61	47	59
Barley	46	59	67	60	61	47	59
Mixed Grains	49	65	70	63	65	47	62
Grain Corn	92	97	102	101	117	84	100
Soybeans	29	34	37	37	41	32	36
Flaxseed	13	25	25	23	27	13	23
Buckwheat	19	23	23	16	27	17	21
Canola	19	33	36	35	33	23	32
				- cwt per acre -			
White Beans	12.5	13.3	14.3	8.5	18.2	14.5	13.8
				- tons per acre -			
Fodder (silage) Corn	11.4	12.9	12.6	12.8	16.0	11.8	13.2
Hay	2.9	3.1	3.0	3.4	3.3	2.9	3.1

Appendix Table 2.--Average Farm Prices, Grain and Forage Crops, Ontario, 1983-1988 (Imperial Units).

Crop	1983	1984	1985	1986	1987	1988[a]	1984-88 5-Year Average
				- dollars per bushel -			
Winter Wheat	3.99	4.20	3.89	3.00	4.82	3.54	3.89
Spring Wheat	3.90	4.10	3.75	3.25	3.10	3.75	3.59
Rye	2.50	2.60	2.50	2.30	2.30	3.00	2.54
Oats	2.21	2.15	1.76	1.42	1.66	2.50	1.90
Barley	3.05	2.97	2.32	1.94	2.05	3.08	2.47
Mixed Grains	2.62	2.57	1.83	1.55	1.66	2.61	2.04
Grain Corn	4.03	3.41	2.87	2.28	2.57	3.68	2.96
Soybeans	9.33	7.55	6.71	6.30	7.19	8.57	7.26
Flaxseed	8.00	7.45	6.40	4.90	4.50	7.45	6.14
Buckwheat	3.00	4.00	4.00	3.60	2.70	3.90	3.64
Canola	8.85	7.80	5.90	4.70	5.50	7.35	6.25
				- dollars per cwt -			
White Beans	28.41	23.61	17.62	42.21	11.02	28.61	24.61
				- dollars per ton -			
Fodder (silage) Corn	21.40	21.70	22.20	18.10	19.60	24.20	21.16
Hay	50.40	50.10	51.80	53.70	55.90	76.60	57.62

[a] Prices and/or yields are subject to revision.

Source: Agricultural Statistics for Ontario, Ontario Ministry of Agriculture and Food, Toronto.

Appendix Table 3.--Average Farm Yields, Grain and Forage Crops Ontario, 1983-1988, (Metric Units).

Crop	1983	1984	1985	1986	1987	1988[a]	1984-88 5-Year Average
				- tonnes per hectare -			
Winter Wheat	3.4	3.8	4.5	3.6	3.5	3.7	3.8
Spring Wheat	2.4	2.9	3.4	2.8	2.8	2.6	2.9
Rye	2.1	2.3	2.5	2.2	2.3	1.8	2.2
Oats	1.8	2.3	2.6	2.3	2.3	1.8	2.3
Barley	2.5	3.2	3.6	3.2	3.3	2.5	3.2
Mixed Grains	2.2	2.9	3.2	2.8	2.9	2.1	2.8
Grain Corn	5.8	6.1	6.4	6.3	7.3	5.3	6.3
Soybeans	2.0	2.3	2.5	2.5	2.8	2.2	2.4
Flaxseed	0.8	1.6	1.6	1.4	1.7	0.8	1.4
Buckwheat	1.0	1.2	1.2	0.9	1.5	0.9	1.1
Canola	1.1	1.8	2.0	2.0	1.8	1.3	1.8
White Beans	1.4	1.5	1.6	1.0	2.0	1.6	1.5
Fodder (silage)							
Corn	25.6	28.9	28.2	28.7	35.9	26.5	29.6
Hay	6.5	6.9	6.7	7.6	7.4	6.5	7.0

Appendix Table 4.--Average Farm Prices, Grain and Forage Crops, Ontario, 1983-1988 (Metric Units).

Crop	1983	1984	1985	1986	1987	1988[a]	1984-88 5-Year Average
				- dollars per tonne -			
Winter Wheat	146.61	154.32	142.93	110.23	177.10	130.07	142.93
Spring Wheat	143.30	150.65	137.79	119.42	113.91	137.79	131.91
Rye	98.42	102.36	98.42	90.55	90.55	118.10	99.99
Oats	143.30	139.41	114.12	92.07	107.64	162.10	123.07
Barley	140.09	136.41	106.56	89.10	94.16	141.46	113.54
Mixed Grains	143.81	141.06	100.45	85.08	91.12	143.26	112.19
Grain Corn	158.65	134.24	112.99	89.76	101.18	144.87	116.61
Soybeans	342.82	277.41	246.55	231.49	264.19	314.89	266.91
Flaxseed	314.94	293.29	251.95	192.90	177.16	293.29	241.72
Buckwheat	137.79	183.72	183.72	165.35	124.01	179.13	167.18
Canola	390.21	343.92	260.14	207.23	242.51	324.08	275.58
White Beans	626.33	520.29	388.01	930.56	242.95	630.74	542.51
Fodder (silage)							
Corn	23.59	23.92	24.47	19.95	21.61	26.68	23.32
Hay	55.56	55.23	57.10	59.19	61.62	84.44	63.52

[a] Prices and/or yields are subject to revision.

Source: Agricultural Statistics for Ontario, Ontario Ministry of Agriculture and Food, Toronto.

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